Journal of Rural Studies 92 (2022) 404–414

Contents lists available at ScienceDirect

Journal of Rural Studies

journal homepage: www.elsevier.com/locate/jrurstud

Aligning bottom-up initiatives and top-down policies? A comparative analysis of overfishing and coastal governance in Ghana, Tanzania, the Philippines, and Thailand

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ARTICLE INFO

Keywords:
Small-scale fisheries
Overfishing
Socio-environmental pressures
Coastal livelihood trajectories
Coastal governance

ABSTRACT

As coastal communities across the Global South confront the multiple challenges of climate change, overfishing, poverty and other socio-environmental pressures, there is an increasing need to understand diverse coastal governance responses and livelihood trajectories from a comparative perspective. This paper presents a holistic investigation of the pressures coastal communities face in four countries and examines possible meeting points between bottom-up initiatives and top-down policies. We compare the experiences of eight fishing areas in Ghana, Tanzania, Thailand and the Philippines and ask how small-scale fishing communities perceive overfishing and other socio-environmental pressures; what factors determine the success and failure of coastal governance initiatives; and how different initiatives can be made congruent to improve coastal, rural development outcomes. Results from an extensive survey of 835 fisherfolk and semi-structured interviews with 196 key informants show that overfishing remains a significant driver of livelihood trajectories in the communities and that fisherfolk respond through informal mechanisms of collective action. Drawing from these diverse experiences, we propose viewing coastal livelihood trajectories through the integrated dimensions of socio-environmental relationships and coastal governance options and discuss implications that address institutional scalar flexibility, illegal fishing, and persistent marginalisation.

1. Introduction

Coastal communities in the Global South continue to confront a range of socio-environmental pressures that challenge their ability to sustain livelihoods. Climate change, overfishing and other coastal environmental changes magnify vulnerabilities tied to poverty and weak institutional arrangements governing coastal common-pool resources that extend across both marine *and* land spaces (Song et al., 2021; UNDP, 2020, p. 186; Gupta and Bavinck, 2017). These widespread pressures have put millions of coastal households under severe strain most notably the 39 million people directly engaged in capture fisheries as a vital component of coastal livelihood strategies (FAO, 2020).

This article presents a holistic investigation of the pressures coastal communities face in two African and two Southeast Asian countries and examines possible *meeting points* between bottom-up initiatives and top-down policies that aim to improve their well-being. Adopting a

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https://doi.org/10.1016/j.jrurstud.2022.03.032
Received 22 August 2021; Received in revised form 22 March 2022; Accepted 31 March 2022
Available online 13 May 2022

comparison of four countries, it contributes to the literature on rural, coastal governance as a triumvirate of civil society, the market and the state. Notwithstanding the recognition that an effective mix of these three components can lead to environmental sustainability and poverty reduction (IFAD, 2016; Ostrom, 2010), there is still a need to find a workable balance between tailored-made localised policies and those adopted from mainstream international systems. Hybrid models such as co-management, a participatory resource management model involving direct users, government agencies and other actors, have emerged as a middle ground, yet power asymmetries and inequity continue to impede effectiveness and long-term success (d'Armengol et al., 2018; Jentoft et al., 2018). Therefore, it remains instructive from an academic and policy perspective to delve more precisely into the problematique of seeking inclusive, sustainable, and stable meeting points between top down policies and bottom-up initiatives (Gaymar et al., 2014; Koontz and Newig, 2014). As such, this article contributes to a more nuanced understanding of rural, coastal governance spaces in the Global South. Following Betcherman's and Marschke's (2016: 25) call in this journal for more studies on agrarian transformation "in coastal villages depending on fishing and fish farming" and to improve our understanding of livelihood trajectories in such villages amidst marine degradation, this article compares experiences of small-scale fishing communities in Ghana, Tanzania, Thailand and the Philippines. We address three research questions:

1. How do fishing communities perceive the relative weight of overfishing and other socio-environmental pressures?
2. What bottom-up and top-down governance initiatives have been implemented to address overfishing and other socio-environmental pressures, and what factors determine success and failure?
3. How can bottom-up and top-down initiatives be better aligned to bring about improved coastal, rural development outcomes?

All four countries have experienced overfishing and emerging climate change impacts in coastal areas (Silas et al., 2020; Goussard and Ducrocq, 2014; ACMLE, 2013). Whereas Thailand and Ghana are relatively successful middle-income countries in Southeast Asia and sub-Saharan Africa, respectively, fostering inclusive societies has generally proven to be more challenging in the Philippines and Tanzania. But as will be shown in subsequent sections, merely working with national averages can be misleading and hide profound spatial patterns of uneven coastal development. The empirical basis of this contribution consists of an extensive fisherfolk survey (834 respondents) and semi-structured interviews with 196 key informants in eight research areas involving a total of 17 villages (see supplementary data for village locations and photos of the eight research areas).

The article is structured as follows: Section 2 provides a literature overview of coastal livelihood trajectories and meeting points in coastal governance, and section 3 summarises the employed mixed-methods approach. Section 4 addresses research question 1 on socio-environmental pressures, while section 5 deals with research question 2 on bottom-up and top-down efforts. In section 6, we answer the third research question by setting forth the implications of our findings for more resilient rural coastal communities.

2. Coastal livelihood trajectories and governance

2.1. Towards a holistic understanding of coastal livelihood trajectories

Many coastal communities in the Global South face multiple socio-environmental pressures on a daily basis, including the decades-long problem of overfishing and the threats of climate change (Owusu and Andriesse 2022; Silas et al., 2020; Gupta and Bavinck, 2017; Yarwood and Allison, 2021). Other underreported issues are also significant, such as water pollution, the tension between fish farming/aquaculture and other marine activities, population growth, limited agricultural land, and the lack of livelihood alternatives (Thanh et al., 2021). In contrast to inland farmers, fishing communities need to deal with both land and marine challenges which require a holistic assessment of the sustainability of livelihood trajectories (Fabinyi 2020; Ratner and Allison, 2012; Andriesse, 2020). In this article, we emphasize the relevance of livelihood trajectories, taking off from arguments that households' livelihoods are not static but dynamic (Radford and Lamb, 2020). Changes in households' capital – made up of financial, human, natural, physical, and social capital – and the vulnerability context can occur gradually, but for impoverished and vulnerable people, households' assets often change rather abruptly (Rigg, 2012). They can of course also change for the better, such as benefitting from new buyers of fish catch, improvements in sustainable fishing methods, and improvements in coastal governance that could also contribute to a reduction in environmental pressures (i.e. higher levels of natural capital as a result of social capital). In addition, livelihood trajectories are not only shaped by local, but also national and international factors such as the ways in which fisherfolk are connected to global markets (Allegretti, 2019). We concentrate on the potential outcomes of coastal environmental rehabilitation as structured by the complex relationships that households are engaged in. This is in line with the view that a triumvirate of civil society, the market, and the state can improve social and ecological outcomes (Ostrom, 2010; Obadare, 2014; Jentoft et al., 2018; Andriesse and Lee, 2021).

2.2. Meeting points in between top-down policies and bottom-up initiatives

Broadly speaking, efforts to reduce coastal challenges can be divided into three: top-down (national) policies, bottom-up (local) initiatives, and their meeting points. Well-known examples of top-down measures are setting up marine protected areas (MPAs), the zoning of maritime spaces into areas for near-shore small-scale fisheries and industrial fishing further offshore, ridge-to-reef programmes to improve river basin areas, closed fishing seasons (ideally during the reproductive phase) and promoting socio-economic diversification to mitigate overfishing. While these policies have good intentions and are based on scientific knowledge, the results have often been mixed due to a variety of reasons. Each coastal community is different, making "one-size-fits-all" policies very hard to implement, and their enforcement virtually impossible in vast marine spaces (Rosendo et al., 2011; Bennet and Dearden 2014; Kongkaew et al., 2017).

Due to these shortcomings, policymakers and academics have advocated for bottom-up initiatives by coastal communities, who know best what is right for themselves and their environments. They are then seen as the preeminent stakeholders capable of coming up with tailor-made solutions and strategies, supported by government agencies and non-governmental organisations (NGOs) through investments in local social capital formation. Additional finance, land and other tangible means of external support are not going to be effective without improvements in community relationships and relations between the community and outside stakeholders (Tewfik et al., 2008; Freduah et al., 2019; Andriesse,forthcoming; Okeke-Ogbuafor and Gray, 2021).

The third model rests on the argument that neither top-down nor bottom-up approaches work. Instead, local, provincial, national and even international stakeholders should work together to improve coastal governance. Ostrom (2010) referred to this approach as "polycentric systems" while coastal governance scholars have adopted the buzz-word of "co-management". In their review of co-managed small-scale fisheries, d'Armengol et al. (2018) argued that successful co-management requires many elements to be effective, such as co-sharing of power, significant empowerment of users, and active inclusion of civil-society actors. There are many necessary conditions to be fulfilled, presenting the need to investigate informal arrangements, including "the revitalization of pre-modern organisations in times of crisis" (Jentoft et al., 2018, p. 5).

2.3. Analytical underpinning

While we realise that there are multiple socio-environmental pressures at play, it is useful to have overfishing as the starting point, given that coastal villages depend significantly on fishing. At the local level in many parts of the Global South, the challenges remain daunting. Indeed, stocks in these regions are still under severe threat due to a combination of both large-scale illegal, unreported, undocumented (IUU) fishing and the intensification of fishing in densely populated coastal communities with limited economic diversification options due to limited skills and resources (Okafor-Yarwood and Allison, 2021).

In addition to a well-functioning social domain, successful processes of collective action also necessitate a balanced political domain in which disagreements can be solved and marginalised parties can be heard. Therefore, d'Armengol et al. (2018) and Jentoft et al. (2018) also stress the need to address not only unequal power relationships and power imbalances within the fisherfolk communities but also between fishers and other groups in society, arguing for more research on conflicts, power imbalances and ways to address injustices. Solving the overfishing problem needs a consistent focus on balancing power asymmetries and increasing equity, apart from biological and socio-economic considerations. This is particularly pertinent for fisherfolk as they tend to perceive themselves as occupying a more marginalised position within society who benefits from coastal resource extraction and who bears the cost of their degradation and regulation should be central questions (Finkbeiner et al., 2017).

Thus, we propose to view rural coastal transformation and trajectories through a two-pronged approach connecting socio-environmental relationships with coastal governance options (Sievanen et al., 2011; Gaymar et al., 2014). Socio-environmental relationships shaping success, failure, and interaction of community development and coastal rehabilitation amid various pressures provides one dimension. The governance dimension meanwhile includes a continuum of strategies ranging from bottom-up initiatives to top-down policies. As such we follow Koontz and Newig (2014) who also stressed the need to deploy such a continuum. Section 4 is concerned with the left part of Fig. 1, while section 5 interrogates if and how coastal governance has reduced pressures related to overfishing and illegal fishing.

3. Methodology and study sites

3.1. Methods

Our fieldwork was designed to deal with the methodological dilemma of choosing between a few in-depth local case studies and multi-case international comparisons that lack qualitative insights with respect to power asymmetries and equity issues. Béné et al. (2016, p. 187) point out that it is challenging to incorporate the nuances of case study analysis in a global, comparative approach that involves a variety of places. Utilising a mixed-methods strategy involving eight research areas in four countries, we aimed to simultaneously adopt a global and a local perspective of coastal pressures and responses. The spine of our research design consists of the drivers of overfishing (research question 1); top-down policies and local bottom-up initiatives (research question 2); and coastal governance *meeting points* that reduce overfishing and improve coastal, rural livelihoods (research questions 2 and 3).

Thailand and the Philippines have been long standing research countries of the first author. In sub-Saharan Africa, Ghana and Tanzania were selected to compare different levels of socioeconomic development (Thailand and Ghana relatively more successful than the Philippines and Tanzania). Furthermore, the eight research areas - Ada East and Keta in Ghana, Unguja/Zanzibar and Bagamoyo in Tanzania, Trang and Krabi in Thailand, and Barotac Viejo and Tanza in the Philippines - are known to have experienced various coastal challenges. A multi-country comparison at the village level enabled us to obtain insights on perceptions of socio-environmental challenges, livelihood trajectories, and mechanisms of coastal governance. All research areas are fairly accessible from urban centres, which is important for comparing diversification and migration options as well as maintaining relationships with higher-level government agencies and markets (see supplementary data for research locations and photos of the eight research areas). In terms of human development (HDI), Thailand ranks 79th, the Philippines 107th, Ghana 138th, and Tanzania 163rd (UNDP, 2020, p. 344–345).

After obtaining clearance from the Institutional Review Board of the first author's employer, data were collected in 2017 and 2018. Broadly, the data collection consisted of two parts: a survey among 834 households engaged in fishing (to answer research questions 1 and 2) and 196 semi-structured interviews with key informants (to answer research questions 2 and 3). Authors and research assistants used local languages and English for talking to the respondents. All research assistants and co-authors have prior experience with one of the research areas. Oral permission for study sites was sought from the elders of communities and village chiefs.

Households were selected through snowball sampling to ensure that all participants were engaged in fishing at the time of fieldwork (Bradshaw and Stratford, 2010, p. 75). The questionnaire survey was divided into four broad topical areas of inquiry covering basic socio-economic information and livelihood trends and changes, fishing practices and adaptation strategies, the perception of climate change impacts, and relationships with the community, government agencies, and NGOs. Whereas the closed-ended questions compelled respondents to narrow down to only a specific choice of answers, the open-ended questions allowed the respondents to freely talk about their experiences and local knowledge. The quantitative data gathering was not meant to generate

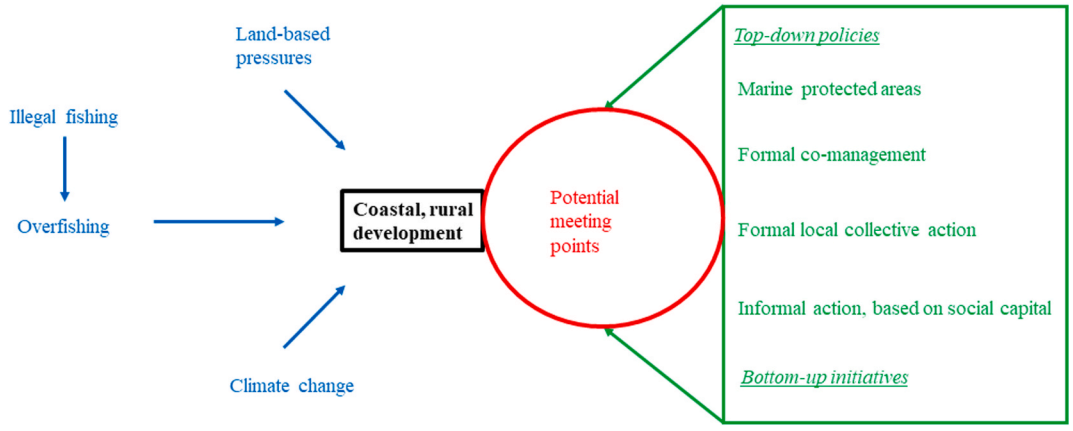

Fig. 1. Socio-environmental relationships and coastal governance options.

inferential statistical analyses, but to create a snapshot of trends, perceptions, and opinions that enabled informed and rigorous rounds of qualitative fieldwork. The semi-structured interviews with key informants were designed to obtain more in-depth insights on issues concerning the socio-economic condition of the villages, the effectiveness of top-down policies and bottom-up initiatives. The two most important groups of key informants are village leaders and leaders of fisherfolk associations. The results of this qualitative investigation were analysed using a topical comparison. The quotes we emphasize in sections 5 and 6 as well as in the supplementary data are representative of the specific research areas.

3.2. National contexts and study sites

To appreciate our local-level findings better, it is worthwhile to first briefly introduce the eight study sites in four countries and their national fisheries and coastal governance contexts.

3.2.1. Ghana

Ghana has a coastline of approximately 550 km. The small-scale fisheries (SSF) sector consists of 13,000 canoes, employs about 107,518 (mostly male) fishers and 1.9 million fish processors and traders (mainly female) and accounts for about 80% of total annual marine fish catch by volume. Fish is the preferred source of protein for most Ghanaians, making it critical for food security. Fish consumption in Ghana is about 28 kg/capita/annum. It accounts for 60 per cent of the national dietary intake of animal protein in Ghana (Rurangwa et al., 2015). However, over the past few years, the fortunes of the fisheries sector have witnessed a continuous downturn. SSF has continued to record very low fish landings, fish production decreased from 179, 721.80 metric tons in 2016 to 159,726 metric ton in 2018. What is more, the number of fishers working in the artisanal fisheries sector nationwide decreased from 139,155 in 2013 to 107,518 in 2016 representing a 22.7% decrease rate (MoFAD 2016). These trends illustrate the marginalised and declining status of fishing-based livelihoods.

Overfishing, illegal fishing by industrial trawlers, climate change, and offshore oil production activities have been attributed to the decreasing fish catch and declining SSF opportunities (Adjei and Overå, 2019; Owusu and Andriesse, 2022). In response to the rapid decline in marine fish stock, the national government introduced a one month closed season policy for the SSF beginning 2019. Recent studies have suggested that, for the closed season policy to be successful, it needs to be accompanied with stricter enforcement of the laws against illegal fishing activities. Located in the southeastern coast of Ghana along the Gulf of Guinea, Ada East and Keta both reflect the challenges faced by many of the fishing livelihoods amid the pressures presented by various coastal activities, including illegal fishing and construction of infrastructure.

3.2.2. Tanzania

Tanzania has a long coastline of more than 800 kms. Coastal resources and biodiversity used to be abundant and in the 1990s there were approximately 17,000 small-scale fishers (Francis and Bryceson, 2001; 82). However, in the last two decades overfishing has, as in other parts of Africa (Okafor-Yarwood and Allison 2021), become a serious problem. Industrial and large-scale (legal and illegal) operations have sought to benefit from high prices and vibrant export markets. But this culminated in problems for small-scale fishers: “The big fish are now only in the deep sea and small boats cannot go there. It’s dangerous. Ships and people disappear. Only last week, one man died at sea in a storm” (The Guardian, 2018). In addition to marine fishing, Tanzania is also dependent on fish from inland water bodies. The country shares three major inland lakes in Africa.

In 2020, the sector provided direct employment to about 202,053 and more than 4.5 million people indirectly depend on fisheries (related) activities. The per capita fish consumption is 7.9 kg and about 30% of animal protein consumption in Tanzania is from fish (MLF 2020). Total country production from fishing activities conducted in capture fishery indicated that fish production was metric tons which was 376,352.71 of which about 86% was from freshwater and the remaining 14% was from the marine waters (MLF 2018). To improve fisheries governance in both freshwater and marine areas, Beach Management Unit (BMUs) were set up in the early 2000s (Kanyange et al., 2014). The town of Bagamoyo, located several kilometers north of Dar es Salaam, is one example of a coastal community where the BMUs have operated with a degree of success. Nearby Unguja, on the island of Zanzibar, have similarly established successful BMUs that have intersected with a vibrant local civil society and tourism sector.

3.2.3. Thailand

Coastal resources have drastically declined in recent decades as well as the catches of small-scale fishers. To counter environmental degradation, the government declared several MPAs around the country. Fishing communities began to adjust by organising themselves to fight against invading trawlers, as well as against government agencies for proclaiming protected areas over their homeland. Some NGOs went to work with fishing communities to promote coastal resource conservation. Community rights were recognised in the 1997 Constitution (Prokkati, 2007), which meant a considerable step towards decentralisation and devolution. Since the early 2000s, the conflicts have been resolved through different modes, but continuing over-utilisation of marine resources has resulted in coastal degradation and affected communities due to IUU fishing (Office of Economic and Social Development Committee, 2011).

In the last few decades, marine fisheries has mainly been based on exploitative and destructive fishing approaches (Kongkaew et al., 2017). In addition, there were about ten thousand illegal fishing boats using fake fishing registration licences. The Thai government has had to deal with collaborative networking of national and international concerned organisations, together with long-standing and persistent protests and campaigns of small-scale fisher networks and severe pressures of receiving a “yellow card” from the European Commission because of IUU fishing. Consequently, the government had to conform with different concerned parties to solve the prevailing problems in Thai fisheries. The 2015 Fisheries Decree and the 2015 Act of Promoting Marine and Coastal Resources Conservation were enacted to deal with marine challenges, but as will be elaborated in section 5, also created new problems for small-scale fishers. Located on the coast of the Andaman Sea, coastal communities in both the provinces of Krabi and Trang rely on a diverse range of income aside from fishing, including rubber and palm oil cultivation. Both are located in sites with various conservation areas and national parks but have developed diverging coastal policy trajectories in response to the 2004 tsunami that affected the coastal communities.

3.2.4. Philippines

As the world’s second largest archipelagic country, it is no surprise that fisheries and aquaculture play important roles in the daily lives of many Philippine households. In 2017 1.21 million people were employed in the fisheries sector; 3% of all employed persons (PSA, 2017). The Philippine fisheries sector is classified into three parts: commercial fishing, municipal (marine and inland) and aquaculture. To deal with the increasing problem of fish stock depletion, the 1998 Fisheries Code introduced a series of measures such as gear bans, spatial restriction and temporal restrictions (closed seasons), but with mixed successes. It is now widely established that small-scale municipal fishers and their families are suffering from declining fish catch and illegal fishing (Andriesse, 2020; Andriesse and Lee, 2021). Furthermore, typhoons continue to threaten small-scale fishing communities. The super typhoons Haiyan (2013) and Rai (2021) destroyed livelihoods, boats, and fishing gear and led to power outages and lack of access to food and water. Typhoon Rai affected more than three million people including

many fishing communities (The Guardian, 2021).

Government agencies have encouraged fisherfolk to diversify to reduce overfishing and seek alternative ways to generate incomes, yet success is not guaranteed due to climate change impacts, distance to markets, and demand volatility such as experienced during the Covid-19 pandemic. To promote sustainable coastal futures, there appears to be a need for more nature-based solutions and climate-resilient technologies (Philippine Daily Inquirer, 2022). The muncipality of Barotac Viejo, located in the province of Iloilo on the central island of Panay, developed a co-management institutional mechanism as an intervention following the 2013 Haiyan super typhoon. The municipality of Tanza along Manila Bay, on the other hand, continues to face the challenges of both an urbanizing coast and sustained intrusion of commercial fisheries in their municipal waters.

4. Socio-environmental pressures

This section summarises the survey results and provides the groundwork for the qualitative insights in section 5. Table 1 provides an overview of socio-economic indicators of the eight research areas, including educational attainment, association membership, change in fish catch, fishing income and change, and availability of agricultural opportunities. Two similarities set the tone. First, except for two Thai cases, fish catches have decreased dramatically in the perception of respondents, and total incomes of households have decreased. These trends have been the clearest in the eyes of the Ghanaian respondents. Thus, the first observation is that fishing-based livelihood trajectories have become harsher, as reflected also in decreased incomes for most of the fisherfolk surveyed. The very high proportion of income decline in Krabi (93% of respondents) is due to reduced revenues from other activities such as growing rubber, palm oil, and fruits. The second similarity relates to association membership. Except for Barotac Viejo (B.V.) in the Philippines all research areas have a relatively low association membership percentage. Table 1 also shows that there is substantial variation in terms of socio-economic dynamics. There is variety in educational attainment (surprisingly low educational attainments in Thailand, the richest country among the four), in the total income level and agricultural opportunities.

An important question we raised was the reason behind the perceived decline in fish catches. Fig. 2 reveals that respondents in each research area came up with a unique combination of reasons. There is no clear single perception for the lower catches in all research areas. Overfishing means intensified fishing by existing fishers and outsiders who come to fish in traditional fishing areas, and population increase is in-migration leading to more fishing activity, causing lower fish catches per household. The former has been identified in most research areas, whereas the latter is most prevalent in Tanza, Krabi and Trang. In Barotac Viejo and the Tanzanian cases, climate change is seen as partly responsible for the declining fish catches, but overfishing and illegal fishing remain the most important and dominant reasons. To further investigate the issue of climate change, we also asked the respondents to look at the impact on village life in general beyond just fishing (Table 2), and we asked them to name the most critical village problems (Table 3). Again, the picture is somewhat fragmented. For example, for the Thai and Ghanaian cases, climate change does not feature much in Fig. 2, but it does in Table 2 and to some extent in Table 3 (unpredictable weather in Krabi and flooding in Ada East). This is precisely the opposite in the case of Barotac Viejo (no significant impact in Table 2, but relevant in Fig. 2).

Furthermore, coastal problems such as higher ocean temperature and sea-level rise were not identified in the Thai and Philippine cases. Thus, despite the available scientific evidence that climate change has started to impact all research areas, it is essential to recognise that one cannot assume that all vulnerable people perceive climate change to be an immediate threat. Comparing Fig. 2, Tables 2 and 3, the cases of Bagamoyo and Krabi are the most consistent in terms of climate change impacts. In Bagamoyo fishing-based households fear climate change as a threat to their livelihood, and they believe it has been one of the causes of outmigration. Families that cannot sustain their livelihood have moved to the largest city, Dar es Salaam. Unusual strong winds, changes in rainfall patterns, coral damage and coral bleaching have all led to a decreased catch. Seven out of eight associations' leaders in Bagamoyo complained about lack of knowledge and education about climate compared to other areas like Unguja. In other words, while Unguja has received much attention from national and international researchers regarding climate change, Bagamoyo and other less-known fishing communities have not been able to enjoy those long-term projects and education.

Fig. 2 and Table 3 also show that illegal fishing remains a big challenge, especially in Tanza in the Philippines and Ada East in Ghana, but also in Barotac Viejo and Keta. Thai government agencies have taken enforcement against illegal fishing relatively seriously, leading many large-scale Thai fishers to explore international waters as well as exclusive economic zones of neighbouring countries. Since 2014, Indonesian authorities have also stepped up their measures against illegal fishing. Nevertheless, illegal fishing by both large and small-scale fishers is difficult to curb because of the enormous marine spaces involved and, at times, political protectionism. Modern satellite technology can detect illegal fishers, yet enforcement requires capabilities and political will. Except for Trang, seawater pollution is not perceived as a significant contributor to declining fish catches.

Table 3 identifies the considerable overlap between fishing challenges and general village issues. The socio-economic pressures of lower incomes, poverty and lack of fuel can also be attributed to declining fish catches since all research areas have fishing as the most important source of livelihood except for Krabi. A significant challenge in several research areas has been freshwater shortage (Table 3). For example, in Barotac Viejo, land use has been limited by saltwater intrusion, and villagers have had to purchase water during the dry season. This has made it more difficult to diversify away from fishing. The co-managed scheme Banate-Barotac Bay Resources Management Council Inc. (BBBRMCI, 2010) supported by Japan until 2011, had addressed marine-based issues, but paid insufficient attention to land-based pressures. As a result of significant top-down facilitation, fisherfolk have set up various associations. This has resulted in an increased level of collaboration, a stronger sense of belonging, but few material benefits due to the limited diversification options (Table 4).

In all, there is a varied mosaic of perceptions. The only two areas

Table 1
Socio-economic snapshot; surveys conducted between December 2017 and February 2018 (B.V. is Barotac Viejo).

	B.V. (Ph)	Tanza (Ph)	Krabi (Th)	Trang (Th)	Ada East (Gh)	Keta (Gh)	Baga-moyo (Ta)	Unguja (Ta)
Respondents (N)	94	100	99	100	110	114	109	108
No formal education, %	0	0	8	2	30	17	27	23
Only elementary school, %	40	43	70	64	57	57	58	26
Association member, %	96	34	23	28	9	32	36	30
Fish catch decrease in last 5 years, %	59	96	51	53	90	99	85	79
Median monthly fishing income, US$	60	75	154	276	110	132	67	134
Income decrease in last 5 years, %	49	81	93	54	90	96	73	68
Agricultural opportunities, %	60	10	52	5	3	12	58	45

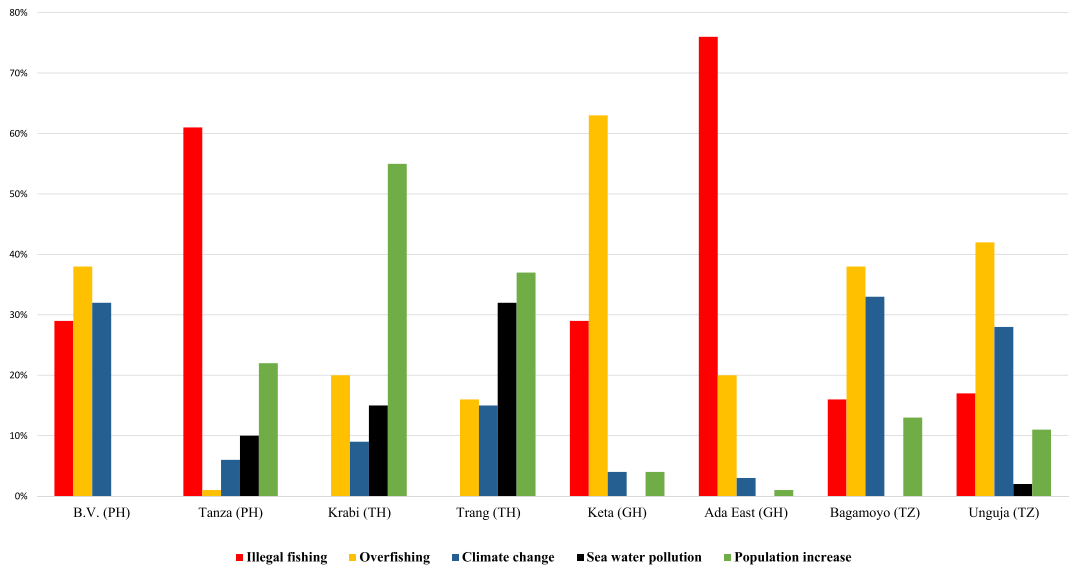

Fig. 2. Reasons for decling fish catch, multiple answers possible.

Table 2
Perception of climate change impacts in the last 10 years (bold for more than 50% of respondents).

	Krabi (Th)	Trang (Th)	B.V. (Ph)	Tanza (Ph)	Ada East (Gh)	Keta (Gh)	Bagamoyo (Ta)	Unguja (Ta)
Higher temperature in hot seasons	**78**	**73**	32	**59**	**77**	**93**	**82**	**74**
Stronger waves	**85**	**64**	41	29	**72**	**94**	30	36
More coastal erosion	**89**	**59**	27	4	**53**	25	**57**	**64**
Higher ocean temperature	42	46	17	16	**65**	**66**	**69**	**54**
Sea-level rise	38	43	33	14	**79**	**83**	**62**	32
More rainfall in rainy seasons	**83**	**61**	41	39	31	25	17	23
More tropical storms	**80**	**64**	36	28	3	4	17	21
Drier in hot seasons	23	34	20	25	24	25	**69**	47
More floods	27	11	15	14	22	47	10	19

Table 3
Most important village problems according to the respondents; % calculated based on the number of times a particular problem appeared as first, second and third rank. Respondents were free to choose village problems.

Barotac V. (Ph)	Tanza (Ph)	Krabi (Th)	Trang (Th)
Water shortage 27	Illegal fishing 21	Unpredictable weather 19	Water shortage 20
Bad road 21	Typhoons 9	Lower incomes 18	No land rights 19
Lower incomes 8	Low fish catches 8	–	Drugs 14
Ada East (Gh)	**Keta (Gh)**	**Bagamoyo (Tz)**	**Unguja (Tz)**
Illegal fishing 19	No harbour 25	Unemployment 12	Water shortage 15
Unemployment 16	Unemployment 24	Poverty 11	Poverty 14
Flooding 12	Lack of fuel 10	Low education 6	Bad health 10

with a clearer singular problem are Tanza in the Philippines and Ada East in Ghana, where illegal fishing stands out. This section has focused on the *what* and *where* of coastal socio-environmental pressures. The next two sections discuss the *how* and *why* of the relationships between overfishing in a broad sense and coastal governance challenges (Fig. 2).

5. Tackling overfishing through bottom-up initiatives and top-down policies

This section highlights important issues related to overfishing, illegal fishing and initiatives to address these pressures and improve livelihoods. Rather than providing an exhaustive overview of all issues in all eight areas, we focus on salient and representative issues that lay bare governance complexities and successes using the most thematically relevant case study sites across the four countries (Barotac Viejo is not discussed in this section as coastal livelihood challenges are not as pronounced as in the other research areas).

5.1. Illegal fishing and community challenges: Ada East (Ghana) and tanza (The Philippines)

Two of the sites that suffer the most from illegal fishing are Ada East in Ghana and Tanza in the Philippines (Fig. 2 and Table 3). Despite the establishment of laws and regulations in many countries, enforcement at the local level remains elusive. The cases of Ada East and Tanza show that short-term livelihood imperatives, local politics, and the absence of trust have eroded the prospects of reducing illegal fishing (see also Gaymar et al., 2014 on the challenge of building local trust).

In the case of Ada East, illegal fishing activities have continued in the form of unapproved nets and intensification of light fishing. Majority of the fisherfolk reported that compared to 10–15 years ago, the quantity of fish catch has decreased significantly. The light fishing operation is usually accompanied with the use of explosives and chemicals. Fisherfolk observed that these practices have contributed to the destruction of the marine ecosystem. According to some local leaders, light fishing kills fingerlings and the use of small mesh-size nets catches most of the small fish. Therefore, they have called for more education of fishers on sustainable harvesting and more stringent measures to reduce IUU. The Ministry of Fisheries has sought to assist local communities, but this top-down approach appears to be ineffective (see also the supplementary file for more representative quotes):

Table 4
Summary of interventions to deal with the four socio-environmental pressures.

	Top-down policies	Implementation and local outcomes
Barotac Viejo	Co-managed BBBRMCI, including an MPA; interventions after the 2013 Typhoon Yolanda	Moderate success; social capital formation and some environmental rehabilitation, but few material benefits
Tanza	Efforts to curb illegal fishing, yet weak enforcement	More individual adaptation (seeking non-fishing work) than social capital formation
Krabi	Successful initiatives after the 2004 tsunami followed by some recent challenges	*Meeting points* and synergies; effective NGOs and collaboration between local government agencies
Trang	Few successful policies after the 2004 tsunami, little interest from government agencies in addressing the plight of coastal communities	Few local capabilities, low level of social capital and collective action, no opportunities for agriculture
Ada East	Efforts to control light fishing failed because of lack of trust. State-led distribution of subsidised premix fuel.	Lack of interest in associations and social capital formation; Absence of NGO involvement.
Keta	Construction of sea defence wall in 2004 led to coastal communities being resettled further away from the sea	Limited diversification opportunities, very little presence of collective action
Bagamoyo	Setting up BMUs	*Meeting point;* BMUs effective regarding marine conservation and diversification
Unguja	Support from central and local governments and NGOs; both marine and non-marine initiatives	Effective bottom-up organisations; *meeting points* especially in cases of monitoring illegal fishing, social and human capital formation

> *The European Union implements the project through the Fisheries Ministry, but the approach is not that effective because all the money is being spent on workshops for fishermen and assemblymen, so they call the fishermen to Accra and Secondi–Takoradi, lecture them and it ends there because the fishermen are not capable of reporting [to their communities] exactly what was taught* (Local journalist/community leader, Ada East, Ghana).

Indeed, the Ghanaian government to date has not set up large projects such as maritime protected areas (Fig. 1). Previous efforts by the state to introduce certain community-based groups to tackle marine degradation have in most cases failed due to political factors and ineffective collaboration:

> To combat overfishing and illegal fishing, the fisheries ministries set up a fisheries watchdog committee (selected individuals from the village responsible for ensuring sustainable fisheries resource exploitation) and they wanted to inaugurate the committee, but the people here stood against it and the minister could not inaugurate the committee. This is because they see the ministry going partial, the ministry has therefore come out with some by-laws to regulate fishing and local fishers want the fisheries ministry to implement the laws in a holistic manner. This area lacks effective traditional and political leadership. (Local journalist/community leader, Ada, Ghana)

Tanza in the Philippines has been affected by two types of illegal fishing: small-scale use of destructive gear by locals and large-scale intrusion of commercial fisheries from other parts of the country. Fisherfolk attest to the significant livelihood impacts, especially of commercial trawl fishing, as they are not able to compete with the efficiency of such gear. Fisherfolk are then reliant on municipal marine law enforcement to enforce rules that prohibit these gear in municipal waters. Effective enforcement, however, depends on adequate resources to patrol the coastal waters, which have been undermined by local patronage politics, the inadequacy of existing penalties and the scalar mismatch between the scope of the illegal fishing problem and the limited extent of enforcement. Many of the commercial boats are owned by local politicians, which make apprehending them difficult and which continue to allow their operations unchecked in prohibited zones designated for small-scale fisheries.

> *There is no government agency that is really committed to getting rid of illegal fishing. We sometimes hear of news that even someone in BFAR [Bureau of Fisheries and Aquatic Resources] alerts these vessels when they could safely set out without being apprehended. There are agencies that benefit from illegal fishing; that is why until now, this problem cannot be resolved* (Fisherfolk, Tanza, Philippines).

> *Some of those who fish here are outsiders, from Quezon, other parts of Manila Bay, Iloilo, all over. They have been earning less, so they are looking for other places to fish. That is why we have been suffering. (Bantay Dagat Officer,* Tanza, Philippines*)*

Tanza illustrates the difficulty of enforcing top-down policies when local contingencies such as political connections and issues of scalar mismatch are entrenched. The ability of the community-deployed *Bantay Dagat* or Sea Watch to monitor the municipal waters are limited by their minimal enforcement power and constrained capacities, which become especially challenging in addressing the more mobile and spatially extensive operations of commercial fishing boats. The outcome for fisherfolk has been individual, rather than collective, forms of responses to the threats of illegal fishing and impacts of declining fish catch, including cyclical migration to the city during times of poor conditions.

5.2. *Overfishing in severely marginalised communities: keta (Ghana) and trang (Thailand)*

In two of the sites, Keta in Ghana and Trang in Thailand, fisherfolk experience overfishing and illegal fishing that further aggravate already precarious coastal conditions driven by inadequate capacity of collective action to deliver change and the constraints posed by existing land ownership patterns. In Keta's villages of Vodza and Adzido, fisherfolk in the more than 80 boats that catch anchovy, salmon and cassava fish have stated that since the start of the 21st century, the fish catches have decreased. The decline in fish landing was partly blamed on the over-dependence on fisheries resources by coastal communities which has compelled fishers to even resort to illegal gears and other unapproved methods in the extraction of fisheries resources. A fisher based in Adzido opined:

> *Because fisherfolk are reporting low catches, we have seen an increase in the use of illegal fishing gears for fishing activities. Some of the illegal fishing activities include the use of chemicals such as dichlorodiphenyltrichloroethane (DDT), explosives like carbides together with monofilament nets. Fishing is the main job we do here, so we need the government to assist us with a landing site with fish storage facilities. During the bumper harvest season, a lot of fish caught goes waste because of the absence of storage facilities in the community"* (Fisherfolk, Adzido, Keta, Ghana).

Fisherfolk also reported about the increasing cost of fishing tools and the unavailability of pre-mix fuel. There are some functioning associations such as the Vodza Beach Landing Committee and the Adzido Youth Association (32% of the respondents are members of an association; see Table 1), yet many members reported that they see little benefits from collective action and admitted they themselves are still engaging in illegal light fishing. The associations are incapable of bringing about significant changes and are supported by neither government agencies nor external NGOs. The government's most visible highly top-down project is the sea defence wall erected in 2004. The households who had to relocate for this project generally viewed it as positive because it

led to reduced coastal erosion but fisherfolk still experience damage to their livelihoods, particularly during storms.

> *This area is a sandy beach, so it is easy for the sea to erode the shore. In 2004 when the sea defence project was completed – it helped to break the waves and stabilise the shoreline. However, the storms are getting stronger, whenever there is a storm, fishing boats capsize and other fishing gears are destroyed. Fisherfolk do not receive any relief items from the district assembly office* (Community leader and fisherfolk, Adzido, Keta, Ghana).

Findings from the Thai Province of Trang also demonstrated a significant degree of marginalisation in coastal communities that existing mechanisms of governance have failed to address adequately. The villages are located in lowland areas adjacent to mangrove forests with very limited land rights. Consequently, land has turned out to be a weak asset to improve livelihoods (Table 3). Drought has become the major threat for most Thai communities in dry seasons (Mr.Data, 2020). Many fisherfolk increasingly feel disgruntled due to the increasing reductions in both marine and non-marine livelihood options. Based on the interviews, Trang small-scale fishers faced a land ownership problem. Only about fifty-seven percent of them have their own housing land, whereas only about fifty-one percent of the landowners have land titles. Meanwhile, only about eight percent of the fishers have farmland. As most of the fishers live on public land in mangrove forest areas without land ownership. Their habitation is based on contractual negotiation with the government. Moreover, their shortage of fresh water in dry season is another severe pressure for their living, in addition to minimum catches. About seventy-three percent of the fishers were hopeless not only about the future of their land ownership, but also their children's and their own livelihoods. Therefore, almost all of them expected the government to provide free-of-charge and high-quality education for their children for the betterment of their career paths. The following quotes illustrate the current difficulties:

> *The younger generation has few options for work. If not working in a city where income can only live a day to day, but it is not able to secure for long life. So, they have to go into the sea for fishing and it will lead to more competition for fisheries resources."* (Fisherfolk, Trang, Thailand)

In both cases of the severely marginalised sites of Keta and Trang, the outcomes of socio-environmental pressures on fisherfolk communities have been magnified by the limitations of existing governance mechanisms. The top-down national government interventions have failed to adequately address their conditions of precarity rooted in land issues, lack of agricultural opportunities and exposure to particular coastal vulnerabilities. Meanwhile, the limited bottom-up initiatives through collective action have achieved minimal change due to constrained community capacities and the absence of synergy with top-down interventions.

5.3. Meeting points in coastal governance: krabi (Thailand), bagamoyo, and unguja (Tanzania)

Unlike the cases in the previous two sections, Krabi in Thailand and Bagamoyo and Unguja in Tanzania demonstrate some degree of success in achieving *meeting points* between bottom-up and top-down efforts. The situation in Bagamoyo (Tanzania) has been relatively favourable. The increase in population and improved fishing gear are the key driving forces for overfishing. To overcome this, the government facilitated local governmental action and involvement of local communities through BMUs, as introduced in section 3.2. Under this formal co-managed scheme (Fig. 1), local stakeholders and authorities are expected to protect the marine environment and regulate fisheries. It took a few years before the BMUs became accepted, but notable successes can be claimed, as illustrated by the following account:

> *We help seaweed farmers in making the products (value addition) out of seaweed such as soap and body oil. We have succeeded to have an office, which is a very big step, we keep our machines and sell our products too. We have succeeded in having different products now, and we see a very good response from the people who buy our products."* (Government representative, Bagamoyo, Tanzania).

In addition, there is a considerable degree of associational vibrancy, with 36% of respondents being members of an association (Table 1). This is because well-organized local associations attract fisherfolk with material and non-material benefits.

In Unguja significant successes have also been achieved (Table 4). This can be attributed to relatively high educational attainments, additional revenues due to the vibrant pre-pandemic tourism sector and proactive behaviour of local civil society.

> *We have been able to increase the income of various people in a community through entrepreneurship training and participation in various discussions pertaining to income generating opportunities. Also, we have been able to educate various fishermen and processing units on how they can perform their activities in an environmentally sustainable manner. We work with the government and NGOs like Mwambao, also with broadcasting units in dissemination of our activities* (NGO chairman, Unguja, Tanzania).

> *There are tree planting activities taking place in this village and the Government has helped in constructing a wall that prevents water from reaching people's houses. BMU and Menai Bay conservation units which are under the government are struggling to control illegal fishing. The village authority is making efforts and working together with the NGO in this village to eradicate these problems* (Village leader, Unguja, Tanzania).

Thus, important success factors of the BMUs have been its collaborative and participatory set-up as well as a long-term perspective to improve both the natural environment and coastal livelihoods. In other words, the BMUs were designed to seek effective meeting points between the top-down policy and bottom-up priorities.

Krabi fisherfolk in Southern Thailand have changed from reactive to proactive stakeholders (Jentoft et al., 2018) and, surprisingly, in rather loose and informal structures (only 28% of the respondents are members of an association; see Table 1). Collaboration occurs in a flexible manner whereby fishers and other stakeholders come together based on an issue rather than vested interests, facilitated by elected sub-district and district level officials. The coastal communities have also been able to benefit from an integration of bottom-up initiatives and top-down policies, despite a marked process of increasing overfishing related to the bust in global rubber prices. The government strongly promoted rubber and oil palm during the 1980s and 1990s. However, the rapidly declining price of rubber and, to a lesser degree, oil palm, seriously affected the national economy and the livelihoods of 1.54 million rubber-based households. When rubber and oil palm revenues declined, many villagers turned to fishing for supplementary income. In addition, the implementation of the 2015 Fisheries Decree limits small-scale fishing to a zone within 3 km from the shoreline. Nevertheless, fisherfolk in Krabi are still benefiting from the spark in local collective action that started after the 2004 tsunami (Table 4). New problems such as the influx of rubber farmers-turned-fishers are tackled through governance meeting points. NGOs such as the Raks Thai Foundation have created an institutional environment conducive to finding holistic solutions that focus not only on overfishing:

> *We must be prepared for adaptation plans because whenever any organization comes to ask what we would do, how, where, when and how much budget you need, etc., we will be able to give them a clear answer straight away. We could assure them that we, the villagers, really have plans for adaptation. And we will not miss that opportunity* (Core team member, NGO, Krabi, Thailand).

The foundation managed to create a multi-scalar policy environment in which village leaders, Sub-district Administrative Organisations (SAOs), and district officials come together to identify needs and establish projects focusing on food security and livelihood improvements.

6. Discussion and possible ways forward

This article addressed socio-environmental pressures in four countries where small-scale fisheries remain and will remain an important part of rural landscapes and agrarian transformation in coastal areas. We compared eight research areas covering coastal communities in Ghana, Tanzania, Thailand and the Philippines through connecting socio-environmental pressures to coastal governance. The first key finding is that overfishing remains a pressing problem that has proven to be difficult to solve in all the four countries. The second key finding is that effective governance meeting points between top-down and bottom-up initiatives are the exception rather than the norm. In addition, the establishment of such meeting points can be the result of formal co-management schemes or informal collaboration between various government and civil society stakeholders.

Table 4 provides a summary of the top-down policies implemented and their local outcomes in the eight sites and identifies the areas where meeting points achieved success in addressing these socio-environmental pressures. The rest of this section discusses the implications of the empirical results and suggests possible ways forward, thus mainly focusing on the third research question as introduced in section 1.

We have identified three main outcomes of our empirical inquiry:

1. Instead of formal co-management schemes and marine protected areas, most communities have addressed socio-environmental pressures through less rigid structures such as associations and informal processes of local collective action (Fig. 1). Nevertheless, membership alone does not determine success and improved outcomes, such as in Barotac Viejo (the Philippines). In Krabi (Thailand) and Bagamoyo (Tanzania), the situation has been the opposite, wherein local collective action has been more effective despite low membership rates.
2. Effective meeting points between bottom-up initiatives and top-down policies can facilitate human capital formation (Unguja, Tanzania) and can compensate for relatively low levels of human capital, as observed in Bagamoyo (Tanzania) and Krabi (Thailand, see also Table 4).
3. Overall, the coastal communities in Ada East, Keta (both in Ghana) and Trang (Thailand) are the most marginalised and have received little top-down support. In the Ghanaian context, most of the top-down policies specifically targeted at reducing overfishing and rebuilding coastal livelihoods have failed because of lack of trust between involved stakeholders (Gaymar et al., 2014). This shows that development practitioners should focus less on concepts such as *middle-income* countries and *average* household incomes. Instead, there is a need to pay more attention to the most marginalised communities in relatively successful countries such as Ghana and Thailand.

In light of these findings, we now address the third research question: how can bottom-up and top-down efforts be better aligned to improve coastal, rural development outcomes (Fig. 1)? The first implication relates to the issue of institutional scalar flexibility. Our results reveal that each research area grapples with a unique set of challenges. It is advisable to look closer at the spatial, socio-environmental, and local political features of the prevailing challenges and difficulties. National governments can set the main objectives and parameters while processes and specific measures can be left to stakeholders at provincial or local levels (Nagendra, 2018; UNDP 2020, p. 185–187). Relatively well-endowed and functioning coastal spaces could seek a more bottom-up informal approach, while areas facing severe resource or environmental limitations would be better off to seeking a governance meeting point that involves more directions from provincial authorities.

As revealed in Fig. 2 and section 5.1, illegal fishing has remained a serious problem. It has become clear that local agencies alone cannot handle illegal fishing practices (Okafor-Yarwood and Allison 2021). Addressing illegal fishing in the Philippines and Ghana requires robust long-term support from authorities operating at higher levels of scale. Leaving enforcement to local authorities with limited capacity is insufficient. Bottom-up community initiatives need to be complemented with national and even transnational policies to be effective in addressing a complex problem such as illegal fishing. Experiences in the Pacific Ocean demonstrate that successes can be achieved (FFA 2021).

The third implication is concerned with persistent marginalisation. The most striking case among our research areas is Trang, where communities have been marginalised by the implementation of top-down policies which exacerbate their prevailing constraints of geographical conditions and land ownership. Despite their existing collaboration internal dynamics have also caused difficulties, especially regarding the implementation of policies. Networks between village leaders and government authorities are weakened by political conflicts. Policymakers thus should forge the creation of institutional meeting points (Koontz and Newig, 2014; Schlüter et al., 2021); for example collaboration as occurred in neigbhouring Krabi after the 2004 Tsunami. In contrast, since the tsunami coastal communities in Trang have not seen improvements and instead, top-down government controls have reduced village leaders' flexibility and motivation (Chareonmuang, 2019).

In sum, confronting the multiple socio-environmental pressures that coastal communities face requires nuanced understanding of various place-based contexts while recognizing similarities and parallels in governance strategies and livelihood trajectories. In this article, we have provided a comparative and integrated investigation of potential meeting points that could help inform multi-scalar, meso-level initiatives toward improving the well-being of rural, coastal communities (Crescenzi and Rodríguez-Pose, 2011). As a rising tide does not automatically lift all boats amidst contemporary rough seas, there is a need to reconcile top-down policies and sub-national, spatially targeted bottom-up initiatives.

Funding

This research project was generously funded by a Grant from the National Research Foundation of Korea, No. 2017S1A5A8020492.

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Acknowledgements

We would like to thank all research assistants for their valuable work during the fieldworks. We offer our sincere condolences to the family and friends of Paul Onyango. Without him we could not have conducted the fieldwork in Bagamoyo and Unguja.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jrurstud.2022.03.032.

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